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November 20, 2003

Mail Stop Appeal Brief- Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Re: Appellant's Brief  
(Our File 1-15300)

Honorable Sir:

Enclosed are three copies of Appellant's Brief in respect of Application Serial No. 08/971,851 entitled "Surface Tension Relieved Mounting Material."

A check in the amount of \$330.00 to cover the fee required under 37 C.F.R. § 1.117(c) is enclosed. Please charge any additional fees or credit overpayment to Deposit Account No. 13-1816.

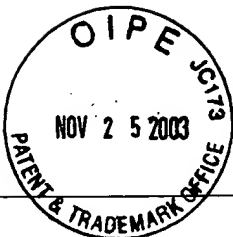
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Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Appeal Brief - Patents, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 on:  
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*Heidi M. May*  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	]	
Loyd R. Hornback III, et al.	]	
	]	Group Art Unit: 1764
Serial No.: 08/971,851	]	
Filed: November 17, 1997	]	Examiner: Tran, H.
For: SURFACE TENSION	]	
RELIEVED MOUNTING	]	
MATERIAL	]	

APPELLANT'S BRIEF

Mail Stop Appeal Brief- Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

This brief is in furtherance of the Notice of Appeal, which was timely filed in this case on October 1, 2003. This Brief is being filed in triplicate under the provisions of 37 C.F.R. 1.192. The fees required under 37 C.F.R. 1.17(c) are being submitted herewith.

1. Real Party in Interest

The application was originally assigned to Minnesota Mining and Manufacturing Company. This assignment was recorded on November 17, 1997 at reel 8823 frame 0945. The

application was then assigned from Minnesota Mining and Manufacturing Company to 3M Innovative Properties Company on May 16, 2001. This subsequent assignment was recorded at reel 011843 frame 0179. The real party in interest is 3M Innovative Properties Company.

2. Related Appeals and Interferences

There is no known related appeal or interference which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

3. Status of Claims

Applicants filed a Notice of Appeal in this case on October 1, 2003, appealing the final rejection dated July 1, 2003 of claims 12-16, 18-20, 23-25, 27-31, 34 and 36-47.

The status of each of the claims is as follows:

- 1) Claims cancelled: 1-11, 17, 21-22, 26, 32, 33 and 35.
- 2) Claims withdrawn from consideration but not cancelled: None
- 3) Claims pending: 12-16, 18-20, 23-25, 27-31, 34 and 36-47.
- 4) Claims allowed: 26
- 5) Claims rejected: 12-16, 18-20, 23-25, 27-31, 34 and 36-47.

The claims on appeal are claims 12-16, 18-20, 23-25, 27-31, 34 and 36-47. A copy of the claims on file is submitted in the attached Appendix.

4. Status of Amendments

No amendment was filed subsequent to the final rejection.

## 5. Summary of the Invention

The present invention relates to pollution control devices including a surface tension relieved mounting article for use in mounting monolithic structures (specification page 1, lines 8-11). The pollution control devices in accordance with the invention include a housing with a pollution control element having an outer curvature disposed within the housing (page 4, lines 4-13; Fig. 1). A mounting article, formed of a sheet material useful for mounting such a pollution control element and preventing exhaust gas from bypassing the pollution control element, is disposed between the pollution control element and the housing (page 4, lines 26-32; Fig. 1). The sheet material has major top and bottom surfaces, a thickness, a length and a width corresponding to a direction of exhaust gas through the device (page 2, lines 6-9). Further, the sheet material has at least one score-line in the major top surface and across the entire width of the sheet material (page 2, lines 9-11; page 5, lines 1-8; page 7, lines 2-3; page 8, lines 24-26; Examples 1-7; Figs. 3B, 4B, 5B, 6B, 7B, 8B).

The at least one score line in the major top surface and across the entire width of the sheet material relieves enough surface tension in the sheet material that, when the sheet material is disposed around the curvature of the pollution control element, cracking or breaking of the sheet material that would otherwise occur is avoided (page 2, lines 16-18). In addition, the at least one score line across the width of the sheet material allows for the use of shorter pieces of sheet material than would otherwise be required, providing a cost savings for materials (page 5, lines 24-28; page 11, lines 8-11; Examples 1-3 and Comparative Example C1).

6. Issues

The issues for appeal are:

1) Whether the drawings are properly objected to because in Fig. 3B and 4B “19” should be pointed to the larger radius curvature.

2) Whether claims 29-30 and 39-41 are improper under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

3) Whether claims 29-30 and 39-41 are indefinite under 35 U.S.C. 112, second paragraph, as failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4) Whether claims 12-16, 18-20, 23-25, 27-28, 34, 36-38, 42, and 44-47 are obvious under 35 U.S.C. 103 over JP 61-89916.

5) Whether claims 19-20 are obvious under 35 U.S.C. 103 over JP 61-89916 in view of JP 2-61313.

6) Whether claims 29-31 and 39-41 are obvious under 35 U.S.C. 103 over JP 61-89916 in view of the Corn U.S. Patent No. 5,332,609 (hereinafter “Corn”).

7) Whether claims 12-16, 18-20, 23-25, 27-28, 34, 36-38, 42 and 44-47 are obvious under 35 U.S.C. 103 over JP 2-61313 in view of JP 61-89916.

8) Whether claims 28-31 and 39-41 are obvious under 35 U.S.C. 103 over JP 2-61313 in view of JP 61-89916 and Corn.

7. Grouping of Claims

1) With regard to the rejection of claims 29-30 and 39-41 under 35 U.S.C. 112, first paragraph, the claims stand or fall together.

2) With regard to the rejection of claims 29-30 and 39-41 under 35 U.S.C. 112, second paragraph, the claims stand or fall together.

3) With regard to the various rejections of the claims as obvious under 35 U.S.C. 103, the claims 12-16, 18-20, 23-25, 27-31, 34 and 36-47 do not stand or fall together for the reasons set forth below.

8. Arguments

1) The Proposed Drawing Changes Overcome the Objection

The drawings have been objected to on the basis that in Figs. 3B and 4B, “19” should be pointed to the larger radius of curvature. The Examiner has asserted that the proposed drawing correction allegedly attached to the previous amendment was not found. Although it appears that applicants did in fact submit a proposed drawing change, applicants resubmit herewith for approval a proposed drawing correction with changes in red. The proposed changes show the reference sign 19 in Figs. 3B and 4B pointing to the larger radius of curvature, as shown in Fig. 1, described at page 4, lines 11-13 of the specification, and as suggested by the Examiner. The proposed drawing changes overcome the objection raised by the Examiner.

2) Claims 29-30 and 39-41 Satisfy 35 U.S.C. 112, first paragraph

The Examiner has taken the position that it is unclear where the limitation in claims 29 and 39 of “no score line” is disclosed in the original specification. In this regard, the Examiner notes that any negative limitation or exclusionary proviso must have basis in the original disclosure, and that “the mere absence of a positive recitation” is not a basis for an exclusion.

Claim 29 states that “at least one score-line is located proximate to said smaller radius of curvature and no score-line is located proximate to said larger radius of curvature.” In a similar manner, claim 39 sets forth “said sheet material having at least one score-line located proximate said smaller radius of curvature ... and said sheet material having no score-line located proximate to said larger radius of curvature.”

In rejecting a claim under the first paragraph of 35 U.S.C. 112 for lack of adequate descriptive support, it is incumbent upon the examiner to establish that the originally-filed disclosure would not have reasonably conveyed to one having ordinary skill in the art that an applicant had possession of the claimed subject matter. *Ex parte Parks*, 30 USPQ2d 1234, 1236 (BdPatApp&Int 1993) (citation omitted). Moreover, adequate description under the first paragraph of 35 U.S.C. 112 does not require literal support for the claimed invention. *Id.* (citations omitted). Rather, it is sufficient if the originally filed disclosure would have conveyed to one having ordinary skill in the art that an applicant had possession of the concept of what is claimed. *Id.* (citations omitted). In the *Parks* decision, it was concluded that “it cannot be said that the originally filed disclosure would not have conveyed to one having ordinary skill in the art the concept of effecting decomposition at an elevated temperature in the absence of a catalyst.” *Id.* at 1238. This was despite the fact that the application never explicitly stated that a catalyst was not used.

Similarly, the present application reasonably conveys to one skilled in the art that the inventors had possession of the invention now defined by claims 29 and 39; that is, a pollution control device mounting article having at least one score-line located proximate to the smaller radius of curvature and no score-line located proximate to the larger radius of curvature. For example, such a device is clearly shown in Figs. 3B, 4B and 5B. The sheet material in each case is provided with score-lines only in the area adjacent to the smaller radius of curvature; the area of the sheet material adjacent to the larger radius of curvature is **positively shown** to have **no score-lines**. Thus, the specification clearly provides more than “the mere absence of a positive recitation.” The specification does not merely state that score lines may be placed proximate the smaller radius of curvature. To the contrary, it also clearly shows several embodiments in which there are **no score lines** proximate the larger radius of curvature.

As a result, one having ordinary skill in the art would readily appreciate that applicants had possession of the concepts set forth in claims 29-30 and 39-41. These claims are thus in full compliance with 35 U.S.C. §112, first paragraph, and the rejections are therefore improper.

### 3) Claims 29-30 and 39-41 Satisfy 35 U.S.C. 112, second paragraph

In respect of this rejection, the Examiner has asserted only that “it is unclear as to where it is disclosed in the original specification that ‘no score-line is located proximate to said larger radius of curvature.’” Applicants have responded to this assertion above relative to the rejection of the claims under 35 U.S.C. 112, first paragraph. To the extent the Examiner’s assertion has application to a rejection of the claims under 35 U.S.C. 112, second paragraph, those arguments are incorporated herein. In any event, the Examiner has failed to identify any indefiniteness in these claims; the noted language clearly does not render the claims indefinite. These claims are



in full compliance with 35 U.S.C. §112, second paragraph, and the rejections are therefore improper.

4) Claims 12-16, 18-20, 23-25, 27-28, 34, 36-38, 42, and 44-47 are Patentable

Over JP 61-89916

The Examiner has taken the position that JP 61-89916 discloses a pollution control device and a method for making a mounting article comprising providing a housing 3 containing a pollution control element 2 and said mounting article 1 disposed between the housing 3 and the pollution control element 2; wherein the mounting article 1 comprises a sheet material 1 having major top and bottom surfaces, a thickness, a length, a width and having a plurality of score lines in the top and bottom surfaces of the sheet material 1.

It is further asserted by the Examiner that JP 61-89916 discloses that “the score lines are disposed across the longer direction of the sheet material which appears to be the direction of the gas flowing (Fig. 2) depending on the size of the pollution control element.” In any event, the Examiner has concluded that “it would have been obvious to one having ordinary skill in the art to select an appropriate direction for the score lines, e.g. across the width or the length on the basis of its suitability for the intended use as a matter of obvious design choice, absence showing any unexpected results, since JP 61-89916 discloses that any shape, any number or any arrangement can be used for the score lines as long as to achieve the same effect (pages 3-4 of the translation of JP ‘916 – PTO: 99-3188) and since applicants also admit on page 6, lines 28-31 that the score lines can extend in any direction: across the width or length of the sheet material, i.e. parallel or perpendicular to the gas flow.”

Claim 12 defines a pollution control device comprising a housing, a pollution control element having an outer curvature and being disposed within said housing, and a mounting article disposed between said pollution control element and said housing. In accordance with claim 12, the mounting article comprises a sheet material useful for mounting said pollution control element and preventing exhaust gas from bypassing the pollution control element, said sheet material having major top and bottom surfaces, a thickness, a length, and a width corresponding to a direction of exhaust gas through the device, said sheet material having at least one score-line in the major top surface and across the entire width of said sheet material to relieve enough surface tension in said sheet material that, when said sheet material is disposed around the curvature of said pollution control element, cracking or breaking of said sheet material that would otherwise occur is avoided.

Thus, claim 12 requires that the at least one score-line be across the entire width of the sheet material, the width corresponding to a direction of exhaust gas through the device. It is only with such a structure that several of the advantages of the invention are realized. With the score-line(s) across the entire width of the sheet material, surface tension in the sheet material will be relieved when the sheet is wrapped around the outer curvature of the pollution control element. This recited structure thereby provides for the prevention of cracking or breaking of the sheet material. Further, positioning of the score-line(s) across the entire width of the sheet material requires less of the sheet material in order to completely wrap a monolith than a sheet material without one or more score-lines across its width. See, for instance, Examples 1-3 and Comparative Example C1, page 11 line 18 to page 12, line 16.

The grooves or “continuous concaves 1a” of JP 61-89916 extend only in the length direction of the material, rather than across its width. JP 61-89916 unambiguously teaches in the

second full paragraph on page 3 of the PTO translation that the “grooves 1a are continuously provided onto both surfaces of a seal mat 1 in the longer lateral direction.” (emphasis supplied).” It is further indicated, in the first full paragraph on page 2 of the PTO translation, that “said mats are wound up to more than the halfway in length direction...” (Fig. 2). Thus, the grooves or continuous concaves 1a run the length of the mat, circumferentially about the honeycomb catalyzer, and perpendicular to the gas flow through the pollution control device.

The Examiner’s reliance on Fig. 2 of JP 61-89916 is misplaced, as that Figure clearly supports, rather than contradicts, applicants’ interpretation of the document. The dimensions of Fig. 2 show that the circumference of the honeycomb catalyzer is greater than its length, so that the longer direction of the mat of JP 61-89916 (the direction in which the concaves 1a extend) extends about the circumference of the honeycomb catalyzer. The examples of JP 61-89916 also support applicants’ interpretation, as the honeycomb catalyzer in the examples is said to have a diameter of 10 cm (thus a circumference greater than 31 cm) and a length of only 20 cm (PTO translation page 5, second full paragraph). JP 61-89916 is devoid of any teaching or suggestion for forming at least one score-line across the entire width of the sheet material and in the direction of exhaust gas through the device.

Moreover, the grooves in the mat of JP 61-89916 are designed solely to reduce the excessive occurrence of compressive pressure on the pollution control element while maintaining an excellent air-tight capability. See PTO translation page 1, paragraph 3 and page 2, first full paragraph. The grooves 1a of JP 61-89916 define gaps in the surface of the sheet material, so that when excessive compressive force is applied, a part of the projections b on the surface of the seal-mat move into the concaves 1a and the compressive force is reduced, preventing breakage of the honeycomb catalyzer. In this regard, according to the translation of JP 61-89919

submitted by applicants, “the shape and number of concaves and method used to produce them, etc. are not limited as long as the above-mentioned effect can be achieved.” Page 5, lines 8-10 (emphasis supplied).

On page 4 of the final Office Action, the Examiner states “JP 61-89916 discloses that any shape, any number or any arrangement can be used for the score lines.” In fact, however, this misstates the PTO translation (pages 3-4) in a very important way. The PTO translation actually states that “[a]s long as said effect is obtained, any shape, any number, and any arrangement means can be used for the grooves.” It is submitted that “arrangement means” is equivalent to “method used to produce them” found on page 5 of the translation of JP 61-89916 provided by the applicants. Thus, the “arrangement means” is the process by which the score lines are arranged on the sheet material, rather than their orientation.

Neither translation of JP 61-89916 contains any suggestion that the direction of the grooves 1a can or should be altered so that they extend across the entire width of the sheet material as defined by the claims. In fact, according to the PTO translation, JP 61-89919 continues by providing that “grooves with a wave surface, grooves with a groove that has an in-line arrangement, or grooves with discontinuous multiple depressions can be given other than grooves as shown in Fig. 1.” Obviously, JP 61-89916 did not contemplate the use of a score-line extending across the entire width of the sheet material, such width corresponding to a direction of exhaust gas through the device.

In addition, the sheet material of JP 61-89916 would be unlikely to maintain its “excellent air-tight capability” if the grooves on both the top and bottom surfaces of the sheet material were positioned in the direction of the gas flow through the device. If the grooves in JP 61-89916 were positioned across the entire width of the sheet material, as applicants’ claim,

exhaust gas may flow through the spacing between the housing and the sheet material or through the spacing between the sheet material and the pollution control element (See Fig. 2). According to JP 61-89916, it is only when and where there is “excessive compressive force” applied that a part of the projections b on the surface of the seal-mat move into the grooves/concaves 1a.

With the grooves extending in the direction of the length of the sheet material (and hence about the circumference of the honeycomb catalyzer and perpendicular to the flow of gas through the device) as shown and described in JP 61-89916, the exhaust gas cannot leak through grooves 1a. There is thus no motivation to modify JP 61-89916 as proposed, since such a modification would render the disclosed device less satisfactory for its intended purpose. See *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1994).

Finally, while applicants’ specification may indicate that, in its broadest sense, the invention covered at least one score-line extending across the width or the length of the sheet material, it is unequivocally stated to be preferred to provide the score-line(s) across the width of the sheet material (see, for example, the specification at page 7, lines 2-3). All of the examples include score-lines across the entire width of the sheet material, and all of the drawing figures show the score-lines extending across the entire width of the sheet material. Examples 1-3 and Comparative Example C1 clearly show that, with score-lines across the entire width of the sheet material, less material is required to completely wrap the monolith. Examples 5-7 and Comparative Examples C2 and C3 clearly show that, with score-lines across the entire width of the sheet material, surface cracking is avoided.

With such a clear indication of the preferred embodiment, it is not proper to ignore the differences between the invention defined by applicants’ claims and JP 61-89916 on the basis

that the application also discloses a less preferred embodiment, aspects of which may be disclosed in the prior art.

For all of these reasons, claims 12-16, 18-20, 23-25 and 27 are patentable over JP 61-89916.

In addition, claim 18 further defines the invention of claim 12 “wherein said sheet material has at least one score-line in the major bottom surface and across the width of said sheet material, wherein the score-line on the bottom surface have a cross-sectional shape that is V-shaped and the score-lines on the top surface have a cross-sectional shape that is a vertical line.” While JP 61-89916 shows grooves in both surfaces of the seal mat 1, it suggests neither at least one score-line in the major bottom surface having a cross-sectional shape that is V-shaped nor score-lines on the top surface having a cross-sectional shape that is a vertical line. Accordingly, claim 18 is patentable over JP 61-89916 for these additional reasons.

Further, claim 47 defines the invention of claim 12 wherein the score-line has a cross-section shape that is a vertical line. JP 61-89916 lacks any suggestion of a score-line having a cross-section shape that is a vertical line. In fact, the grooves in the mat of JP 61-89916 are designed specifically to reduce the excessive occurrence of compressive pressure on the pollution control element by defining gaps in the surface of the sheet material, so that when excessive compressive force is applied, part of the projections b moves into the concaves 1a and the compressive force is reduced, preventing breakage of the honeycomb catalyzer. Grooves having a cross-section shape that is a vertical line would not, of course, be able to function in the manner taught by JP 61-89916. Accordingly, claim 47 is patentable over JP 61-89916 for this additional reason.

Independent claim 28 defines applicants' pollution control device as comprising, *inter alia*, a sheet material useful for mounting a pollution control element and preventing exhaust gas from bypassing the pollution control element, said sheet material having at least one score-line extending across the width of the sheet material in a direction that is parallel to gas flow through said pollution control element, said at least one score-line relieving surface tension in said sheet material that would have been generated by said sheet material being disposed around said pollution control element if not for said at least one score-line.

In contrast, and as discussed in detail above, the grooves or "continuous concaves 1a" of JP 61-89916 extend only in the length direction of the material and in a direction that is perpendicular to gas flow through the catalyzer. Thus, for all of the same reasons discussed above with regard to claim 12, claim 28 and all those claims depending directly or indirectly therefrom are patentable over JP 61-89916.

Further, claim 44 further defines the invention of claim 28 wherein the score-line has a cross-section shape that is a vertical line. JP 61-89916 lacks any suggestion of a score-line having a cross-section shape that is a vertical line and, as discussed above, such a structure would frustrate the intended function of the grooves in the seal-mat of JP 61-89916. Accordingly, claim 44 is patentable over JP 61-89916 for this additional reason.

Independent claim 34 is directed to a mounting article for mounting a pollution control element within a pollution control device, said mounting article comprising a sheet material useful for mounting a pollution control element in a housing, where the pollution control element has an outer curved surface. The sheet material is defined as having a major top surface and a major bottom surface, a thickness, a length dimensioned so as to allow said sheet material to be wrapped lengthwise completely around the outer curved surface of the pollution control element

and form a seal between the pollution control element and the housing to prevent gas from bypassing the pollution control element, a width that is smaller than the length, and at least one score-line formed in at least the major top surface of said sheet material, each score-line being disposed across the entire width of said sheet material.

Again, as discussed in detail above, the grooves or “continuous concaves 1a” of JP 61-89916 extend only in the length direction of the material. For all of the same reasons discussed above with regard to claim 12, claim 34 and all those claims depending directly or indirectly therefrom are patentable over JP 61-89916.

Additionally, claim 45 further defines the invention of claim 34 wherein the score-line has a cross-section shape that is a vertical line. As noted above, JP 61-89916 lacks any suggestion of a score-line having a cross-section shape that is a vertical line and such a structure would frustrate the intended function of its grooves. Accordingly, claim 45 is patentable over JP 61-89916 for this additional reason.

Claim 46 further defines the invention of claim 38, which in turn depends from claim 34, “wherein the score-line on the top surface has a cross-sectional shape that is a vertical line and the score-line on the bottom surface has a cross-sectional shape that is V-shaped.” Again, while JP 61-89916 shows grooves in both surfaces of the seal mat 1, it suggests neither at least one score-line in the major bottom surface having a cross-sectional shape that is V-shaped nor a score-line on the top surface having a cross-sectional shape that is a vertical line. Accordingly, claim 46 is patentable over JP 61-89916 for these additional reasons.



5) Claims 19-20 are Patentable Over JP 61-89916 in View of JP 2-61313

Claims 19-20 all depend, either directly or indirectly, from claim 12. JP 2-61313 supplies none of the deficiencies of JP 61-89916 discussed above with regard to claim 12. Thus, each of these claims is patentable at least on the basis of this dependency from a patentable base claim.

6) Claims 29-31 and 39-41 are Patentable Over JP 61-89916 in view of Corn

Claims 29-31 depend, either directly or indirectly, from claim 28. The Examiner cites Corn as disclosing an oval shape for a pollution control element, concluding that it would have been obvious to select an appropriate shape for the pollution control element. While Corn discloses an oval shaped pollution control element, it supplies none of the deficiencies of JP 86-89916 discussed above with regard to claim 28. Thus, each of the claims 29-31 is patentable at least on the basis of this dependency from a patentable base claim.

In addition, claim 29 further defines the invention of claim 28 wherein said at least one score-line is located proximate to said smaller radius of curvature and no score-line is located proximate to said larger radius of curvature of the oval shaped pollution control element, and claim 30 further defines claim 29 wherein said sheet material has at least one score-line located proximate to each of the two smaller radius of curvatures and no score-line is located proximate to either of said larger radius of curvatures.

As discussed above, JP 61-89916 lacks any suggestion or motivation for providing a groove across the width of the sheet material, and clearly further lacks any suggestion for providing at least one score-line proximate the smaller radius of curvature of an oval pollution control element, with no score-lines proximate the larger radius of curvature of the oval pollution control element. Corn discloses a two-layer mounting mat that is devoid of any score-lines, and

thus fails to supply any of the deficiencies of JP 86-89916 in this regard. Claims 29 and 30 are thus patentable over JP 61-89916 in view of Corn for these additional reasons.

Independent claim 39 defines a pollution control device comprising a pollution control element having an oval shaped cross section and a mounting article disposed between the pollution control element and a housing. The mounting article comprises a sheet material useful for mounting the pollution control element and preventing exhaust gas from bypassing the pollution control element. The sheet material has at least one score-line proximate the smaller radius of curvature of the oval pollution control element and extending across the width of the sheet material in a direction parallel to gas flow through the pollution control element. The sheet material has no score-line located proximate the larger radius of curvature of the oval pollution control element. The at least one score-line located proximate said smaller radius of curvature relieves surface tension in said sheet material that would have been generated by said sheet material being disposed around the radius of curvature of said pollution control element if not for said at least one score-line.

The structure defined by claim 39 thus provides at least one score-line in an area of high surface tension, with no score-lines in the areas of lower surface tension. This structure advantageously relieves surface tension and prevents cracking of the sheet material, while also reducing the amount of sheet material required to wrap a given pollution control element. See specification page 5, second paragraph.

JP 61-89916, on the other hand, discloses a sheet material having grooves 1a extending across the length of the sheet material in a direction perpendicular to gas flow through the pollution control element. As discussed in detail above, JP 61-89916 lacks any suggestion or motivation for providing a groove across the width of the sheet material, and clearly further lacks

any suggestion for providing at least one score-line proximate the smaller radius of curvature of an oval pollution control element, with no score-lines proximate the larger radius of curvature of the oval pollution control element.

Corn discloses a two-layer mounting mat that is devoid of any score-lines, and thus fails to supply any of the deficiencies of JP 86-89916 in this regard. The references, either individually or in combination, fail to teach or suggest the invention as defined in claim 39. Claim 39, as well as claims 40 and 41 which depend from claim 39, are therefore patentable over JP 61-89916 in view of Corn.

7) Claims 12-16, 18-20, 23-25, 27-28, 34, 36-38, 42 and 44-47 are Patentable Over JP 2-61313 in View of JP 61-89916

The Examiner has taken the position that JP 2-61313 discloses a pollution control device and method of making a mounting article for a pollution control device comprising a housing containing a pollution control element 1 and said mounting article 5 disposed between the housing and the pollution control element 1, wherein the mounting article 5 comprising a sheet material 5 having major top and bottom surfaces, a thickness, a length, a width and having a plurality of score lines 11 in the top and bottom surfaces of the sheet material 5 and across the width of the sheet material 5.

Independent claims 12, 28 and 34 all require at least one score-line extending across the entire width of the sheet material. It is only with such a structure that several of the advantages of the invention are realized. Thus, with the score-line(s) across the entire width of the sheet material, surface tension in the sheet material will be relieved when the sheet is wrapped around the outer curvature of the pollution control element. This recited structure thus provides for the prevention of cracking or breaking of the sheet material. Further, positioning of the score-line(s)

across the entire width of the sheet material requires less of the sheet material in order to completely wrap a monolith than a sheet material without one or more score-lines across its width.

Neither the recited structure, nor any of the resulting advantages, are taught or suggested by the cited prior art references. JP 2-61313 describes a structure for purifying exhaust gas including a buffer material 5 wrapped around the outer circumference of a ceramic honeycomb 1 and housed in a steel container 6. The buffer material is either provided with holes (translation page 9, lines 1-3) or alternatively, “the same effect can be achieved when the buffer material has a structure where many fine grooves formed diagonally on the surface as in the case of Fig. 2” (translation page 9, lines 13-14). The purpose of these holes or diagonal grooves is to increase the frictional force and to reduce the level of heat conducted by the buffer material.

Hence, JP 2-61313 lacks any teaching or suggestion for positioning a score-line(s) across the entire width of the sheet material. The deficiencies of JP 61-89916 in this regard are discussed at length above. The references, either individually or in combination, fail to teach or suggest the invention as defined in independent claims 12, 28 and 34. These claims, as well as all of the claims depending therefrom, are therefore patentable over JP 2-61313 and JP 61-89916.

Moreover, at least claims 18, 44, 45, 46, 47 are independently patentable over JP 2-61313 and JP 61-89916, as neither suggests forming at least one score-line with a cross-section shape that is a vertical line and/or a score-line on the bottom surface having a cross-sectional shape that is V-shaped, as discussed in more detail above.

8) Claims 29-31 and 39-41 are Patentable Over JP 2-61313, JP 61-89916 and Corn

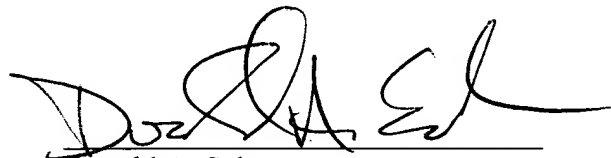
In this rejection, the Examiner applies each of the three references in the same manner noted above with regard to the previous rejections. Accordingly, all of the arguments presented above apply equally to this rejection, and are incorporated herein.

None of the three references suggest sheet material having at least one score-line located proximate said smaller radius of curvature and extending across the width of the sheet material in a direction that is parallel to gas flow through the pollution control element and the sheet material having no score-line located proximate to the larger radius of curvature, as set forth in claim 29, 30 and 39-41. These claims are thus patentable over JP 2-61313, JP 61-89916 and Corn, taken alone or in combination. Further, claims 29-31 depend, either directly or indirectly, from claim 28 and are patentable over the references at least for this reason.

CONCLUSION

For all of the foregoing reasons, it is submitted that all of the claims on appeal are allowable, and a favorable decision to that end is courteously solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Donald A. Schurr', written over a horizontal line.

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## APPENDIX

12. A pollution control device comprising:
  - a housing;
  - a pollution control element having an outer curvature and being disposed within said housing; and
  - a mounting article disposed between said pollution control element and said housing, said mounting article comprising a sheet material useful for mounting said pollution control element and preventing exhaust gas from bypassing the pollution control element, said sheet material having major top and bottom surfaces, a thickness, a length, and a width corresponding to a direction of exhaust gas through the device, said sheet material having at least one score-line in the major top surface and across the entire width of said sheet material to relieve enough surface tension in said sheet material that, when said sheet material is disposed around the curvature of said pollution control element, cracking or breaking of said sheet material that would otherwise occur is avoided.
13. The pollution control device of claim 12 wherein at least two score-lines are formed in the major top surface and across the width of said sheet material.
14. The pollution control device of claim 13 wherein each of said score-lines extend across the entire width of the top surface of said sheet material and the top surface of the sheet material faces the housing.

15. The pollution control device of claim 12 wherein said at least one score-line is perpendicular to the length of said sheet material.

16. The pollution control device of claim 15 wherein the depth of said at least one score-line ranges from about 5 to about 90 percent of the thickness of said sheet material.

18. The pollution control device of claim 12 wherein said sheet material has at least one score-line in the major bottom surface and across the width of said sheet material, wherein the score-line on the bottom surface have a cross-sectional shape that is V-shaped and the score-lines on the top surface have a cross-sectional shape that is a vertical line.

19. The pollution control device of claim 12 wherein said sheet material is intumescent.

20. The pollution control device of claim 13 wherein said sheet material is intumescent, said score-lines extend across the entire width of the top surface of said sheet material and perpendicular to the length of said sheet material and wherein the depth of said score-lines is about 50 percent of the thickness of said sheet material.

23. The pollution control device of claim 12 wherein said pollution control element has a round shaped cross section and said sheet material has a plurality of score-lines in the top surface of said sheet material and the top surface of said sheet material faces said housing.

24. The pollution control device of claim 12 wherein said sheet material has at least one score-line in the bottom surface and across the width of said sheet material and the bottom surface faces said pollution control element.

25. The pollution control device of claim 24 wherein the bottom surface of said sheet material has a plurality of said at least one score-line.

26. A pollution control device comprising:  
a housing;  
a pollution control element disposed within said housing; and  
a mounting article disposed between said pollution control element and said housing, said mounting article comprising a sheet material useful for mounting said pollution control element, said sheet material having major top and bottom surfaces, a thickness, a length and a width, said sheet material having at least one score-line in at least one of the major top and bottom surfaces of said sheet material to relieve surface tension in said sheet material, said at least one score-line extending in a direction parallel to gas flow through said pollution control element, wherein said sheet material includes a first layer suitable for receiving strips of a second layer of sheet material, said strips of a second layer of sheet material attached to said first layer in an adjacent manner to provide said at least one score-line.

27. The pollution control device of claim 12 wherein said score-lines have a cross-sectional shape selected from a vertical line shape, a V-shape, a U-shape, a triangular shape, and a square shape.



28. A pollution control device comprising:

- a housing;
- a pollution control element disposed within said housing; and
- a mounting article disposed between said the pollution control element and said housing, said mounting article comprising a sheet material useful for mounting said pollution control element and preventing exhaust gas from bypassing the pollution control element, said sheet material having a major top surface facing said housing and a major bottom surface facing said pollution control element, a thickness, a length and a width, said sheet material having at least one score-line extending across the width of the sheet material in a direction that is parallel to gas flow through said pollution control element, said at least one score-line relieving surface tension in said sheet material that would have been generated by said sheet material being disposed around said pollution control element if not for said at least one score-line.

29. The pollution control device of claim 28 wherein said pollution control element has an oval shaped cross section defined by a larger radius of curvature and a smaller radius of curvature, said smaller radius of curvature is smaller than said larger radius of curvature, said at least one score-line is located proximate to said smaller radius of curvature and no score-line is located proximate to said larger radius of curvature.

30. The pollution control device of claim 29 wherein the oval shaped cross section of said pollution control device is defined by two larger radius of curvatures that are separated from each other by two smaller radius of curvatures and said sheet material has at least one score-line

located proximate to each of said smaller radius of curvature and no score-line is located proximate to either of said larger radius of curvatures.

31. The pollution control device of claim 28 wherein said at least one score-line has a cross-sectional shape selected from a vertical line shape, a V-shape, a U-shape, a triangular shape, and a square shape.

34. A mounting article for mounting a pollution control element within a pollution control device, said mounting article comprising a sheet material useful for mounting a pollution control element in a housing, where the pollution control element has an outer curved surface, said sheet material having a major top surface facing the housing and a major bottom surface facing the pollution control device, a thickness, a length dimensioned so as to allow said sheet material to be wrapped lengthwise completely around the outer curved surface of the pollution control element and form a seal between the pollution control element and the housing, wherein the seal prevent gas from bypassing the pollution control element, a width that is smaller than the length, and at least one score-line formed in at least the major top surface of said sheet material, each score-line being disposed across the entire width of said sheet material.

36. The mounting article of claim 34 wherein said score-line is perpendicular to the length of said sheet material.

37. The pollution control device of claim 34 wherein said at least one score-line has a cross-sectional shape selected from a vertical line shape, a V-shape, a U-shape, a triangular shape, and a square shape.

38. The pollution control device of claim 34, wherein the sheet material has at least one score-line formed in the major top surface and at least one score-line formed in the major bottom surface and the major top surface is positioned adjacent to the housing.

39. A pollution control device comprising:

- a housing;
- a pollution control element disposed within said housing, said pollution control element having an oval shaped cross section defined by a larger radius of curvature and a smaller radius of curvature; and
- a mounting article disposed between said the pollution control element and said housing, said mounting article comprising a sheet material useful for mounting said pollution control element and preventing exhaust gas from bypassing the pollution control element, said sheet material having a major top surface facing said housing and a major bottom surface facing said pollution control element, a thickness, a length and a width, said sheet material having at least one score-line located proximate said smaller radius of curvature and extending across the width of said sheet material in a direction that is parallel to gas flow through said pollution control element and said sheet material having no score-line located proximate to said larger radius of curvature, said at least one score-line located proximate said smaller radius of curvature relieving surface tension in said sheet material that would have been generated by said sheet

material being disposed around the radius of curvature of said pollution control element if not for said at least one score-line.

40. The pollution control device of claim 39, wherein the score-line has a cross-sectional shape selected from a vertical line shape, a V-shape, a U-shape, a triangular shape, and a square shape.

41. The pollution control device of claim 39, wherein the score-line has a cross-sectional shape that is a vertical line shape.

42. The pollution control device of claim 34, wherein the score-line is in the form of a repeating pattern across the entire width of the sheet material.

43. The pollution control device of claim 42, wherein the repeating pattern is in the form of a saw tooth wave or a sine wave.

44. The pollution control device of claim 28, wherein the score-line has a cross-section shape that is a vertical line.

45. The pollution control device of claim 34, wherein the score-line has a cross-sectional shape that is a vertical line.

46. The pollution control device of claim 38, wherein the score-line on the top surface has a cross-sectional shape that is a vertical line and the score-line on the bottom surface has a cross-sectional shape that is V-shaped.

47. The pollution control device of claim 12, wherein the score-line has a cross-sectional shape that is a vertical line.



CERTIFICATE OF MAILING

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November 20, 2003

Date

Signature: Heidi M. May

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:  
Lloyd R. Hornback III, et al.

Serial No.: 08/971,851  
Filed: November 17, 1997  
For: SURFACE TENSION  
RELIEVED MOUNTING  
MATERIAL

Group Art Unit: 1764

Examiner: Tran, H.

APPELLANT'S BRIEF

Mail Stop Appeal Brief- Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

This brief is in furtherance of the Notice of Appeal, which was timely filed in this case on October 1, 2003. This Brief is being filed in triplicate under the provisions of 37 C.F.R. 1.192. The fees required under 37 C.F.R. 1.17(c) are being submitted herewith.

1. Real Party in Interest

The application was originally assigned to Minnesota Mining and Manufacturing Company. This assignment was recorded on November 17, 1997 at reel 8823 frame 0945. The

application was then assigned from Minnesota Mining and Manufacturing Company to 3M Innovative Properties Company on May 16, 2001. This subsequent assignment was recorded at reel 011843 frame 0179. The real party in interest is 3M Innovative Properties Company.

2. Related Appeals and Interferences

There is no known related appeal or interference which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

3. Status of Claims

Applicants filed a Notice of Appeal in this case on October 1, 2003, appealing the final rejection dated July 1, 2003 of claims 12-16, 18-20, 23-25, 27-31, 34 and 36-47.

The status of each of the claims is as follows:

- 1) Claims cancelled: 1-11, 17, 21-22, 26, 32, 33 and 35.
- 2) Claims withdrawn from consideration but not cancelled: None
- 3) Claims pending: 12-16, 18-20, 23-25, 27-31, 34 and 36-47.
- 4) Claims allowed: 26
- 5) Claims rejected: 12-16, 18-20, 23-25, 27-31, 34 and 36-47.

The claims on appeal are claims 12-16, 18-20, 23-25, 27-31, 34 and 36-47. A copy of the claims on file is submitted in the attached Appendix.

4. Status of Amendments

No amendment was filed subsequent to the final rejection.

5. Summary of the Invention

The present invention relates to pollution control devices including a surface tension relieved mounting article for use in mounting monolithic structures (specification page 1, lines 8-11). The pollution control devices in accordance with the invention include a housing with a pollution control element having an outer curvature disposed within the housing (page 4, lines 4-13; Fig. 1). A mounting article, formed of a sheet material useful for mounting such a pollution control element and preventing exhaust gas from bypassing the pollution control element, is disposed between the pollution control element and the housing (page 4, lines 26-32; Fig. 1). The sheet material has major top and bottom surfaces, a thickness, a length and a width corresponding to a direction of exhaust gas through the device (page 2, lines 6-9). Further, the sheet material has at least one score-line in the major top surface and across the entire width of the sheet material (page 2, lines 9-11; page 5, lines 1-8; page 7, lines 2-3; page 8, lines 24-26; Examples 1-7; Figs. 3B, 4B, 5B, 6B, 7B, 8B).

The at least one score line in the major top surface and across the entire width of the sheet material relieves enough surface tension in the sheet material that, when the sheet material is disposed around the curvature of the pollution control element, cracking or breaking of the sheet material that would otherwise occur is avoided (page 2, lines 16-18). In addition, the at least one score line across the width of the sheet material allows for the use of shorter pieces of sheet material than would otherwise be required, providing a cost savings for materials (page 5, lines 24-28; page 11, lines 8-11; Examples 1-3 and Comparative Example C1).



6. Issues

The issues for appeal are:

1) Whether the drawings are properly objected to because in Fig. 3B and 4B “19” should be pointed to the larger radius curvature.

2) Whether claims 29-30 and 39-41 are improper under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

3) Whether claims 29-30 and 39-41 are indefinite under 35 U.S.C. 112, second paragraph, as failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4) Whether claims 12-16, 18-20, 23-25, 27-28, 34, 36-38, 42, and 44-47 are obvious under 35 U.S.C. 103 over JP 61-89916.

5) Whether claims 19-20 are obvious under 35 U.S.C. 103 over JP 61-89916 in view of JP 2-61313.

6) Whether claims 29-31 and 39-41 are obvious under 35 U.S.C. 103 over JP 61-89916 in view of the Corn U.S. Patent No. 5,332,609 (hereinafter “Corn”).

7) Whether claims 12-16, 18-20, 23-25, 27-28, 34, 36-38, 42 and 44-47 are obvious under 35 U.S.C. 103 over JP 2-61313 in view of JP 61-89916.

8) Whether claims 28-31 and 39-41 are obvious under 35 U.S.C. 103 over JP 2-61313 in view of JP 61-89916 and Corn.

7. Grouping of Claims

1) With regard to the rejection of claims 29-30 and 39-41 under 35 U.S.C. 112, first paragraph, the claims stand or fall together.

2) With regard to the rejection of claims 29-30 and 39-41 under 35 U.S.C. 112, second paragraph, the claims stand or fall together.

3) With regard to the various rejections of the claims as obvious under 35 U.S.C. 103, the claims 12-16, 18-20, 23-25, 27-31, 34 and 36-47 do not stand or fall together for the reasons set forth below.

8. Arguments

1) The Proposed Drawing Changes Overcome the Objection

The drawings have been objected to on the basis that in Figs. 3B and 4B, “19” should be pointed to the larger radius of curvature. The Examiner has asserted that the proposed drawing correction allegedly attached to the previous amendment was not found. Although it appears that applicants did in fact submit a proposed drawing change, applicants resubmit herewith for approval a proposed drawing correction with changes in red. The proposed changes show the reference sign 19 in Figs. 3B and 4B pointing to the larger radius of curvature, as shown in Fig. 1, described at page 4, lines 11-13 of the specification, and as suggested by the Examiner. The proposed drawing changes overcome the objection raised by the Examiner.

2) Claims 29-30 and 39-41 Satisfy 35 U.S.C. 112, first paragraph

The Examiner has taken the position that it is unclear where the limitation in claims 29 and 39 of “no score line” is disclosed in the original specification. In this regard, the Examiner notes that any negative limitation or exclusionary proviso must have basis in the original disclosure, and that “the mere absence of a positive recitation” is not a basis for an exclusion.

Claim 29 states that “at least one score-line is located proximate to said smaller radius of curvature and no score-line is located proximate to said larger radius of curvature.” In a similar manner, claim 39 sets forth “said sheet material having at least one score-line located proximate said smaller radius of curvature ... and said sheet material having no score-line located proximate to said larger radius of curvature.”

In rejecting a claim under the first paragraph of 35 U.S.C. 112 for lack of adequate descriptive support, it is incumbent upon the examiner to establish that the originally-filed disclosure would not have reasonably conveyed to one having ordinary skill in the art that an applicant had possession of the claimed subject matter. *Ex parte Parks*, 30 USPQ2d 1234, 1236 (BdPatApp&Int 1993) (citation omitted). Moreover, adequate description under the first paragraph of 35 U.S.C. 112 does not require literal support for the claimed invention. *Id.* (citations omitted). Rather, it is sufficient if the originally filed disclosure would have conveyed to one having ordinary skill in the art that an applicant had possession of the concept of what is claimed. *Id.* (citations omitted). In the *Parks* decision, it was concluded that “it cannot be said that the originally filed disclosure would not have conveyed to one having ordinary skill in the art the concept of effecting decomposition at an elevated temperature in the absence of a catalyst.” *Id.* at 1238. This was despite the fact that the application never explicitly stated that a catalyst was not used.

Similarly, the present application reasonably conveys to one skilled in the art that the inventors had possession of the invention now defined by claims 29 and 39; that is, a pollution control device mounting article having at least one score-line located proximate to the smaller radius of curvature and no score-line located proximate to the larger radius of curvature. For example, such a device is clearly shown in Figs. 3B, 4B and 5B. The sheet material in each case is provided with score-lines only in the area adjacent to the smaller radius of curvature; the area of the sheet material adjacent to the larger radius of curvature is **positively shown** to have **no score-lines**. Thus, the specification clearly provides more than “the mere absence of a positive recitation.” The specification does not merely state that score lines may be placed proximate the smaller radius of curvature. To the contrary, it also clearly shows several embodiments in which there are **no score lines** proximate the larger radius of curvature.

As a result, one having ordinary skill in the art would readily appreciate that applicants had possession of the concepts set forth in claims 29-30 and 39-41. These claims are thus in full compliance with 35 U.S.C. §112, first paragraph, and the rejections are therefore improper.

### 3) Claims 29-30 and 39-41 Satisfy 35 U.S.C. 112, second paragraph

In respect of this rejection, the Examiner has asserted only that “it is unclear as to where it is disclosed in the original specification that ‘no score-line is located proximate to said larger radius of curvature.’” Applicants have responded to this assertion above relative to the rejection of the claims under 35 U.S.C. 112, first paragraph. To the extent the Examiner’s assertion has application to a rejection of the claims under 35 U.S.C. 112, second paragraph, those arguments are incorporated herein. In any event, the Examiner has failed to identify any indefiniteness in these claims; the noted language clearly does not render the claims indefinite. These claims are

in full compliance with 35 U.S.C. §112, second paragraph, and the rejections are therefore improper.

4) Claims 12-16, 18-20, 23-25, 27-28, 34, 36-38, 42, and 44-47 are Patentable

Over JP 61-89916

The Examiner has taken the position that JP 61-89916 discloses a pollution control device and a method for making a mounting article comprising providing a housing 3 containing a pollution control element 2 and said mounting article 1 disposed between the housing 3 and the pollution control element 2; wherein the mounting article 1 comprises a sheet material 1 having major top and bottom surfaces, a thickness, a length, a width and having a plurality of score lines in the top and bottom surfaces of the sheet material 1.

It is further asserted by the Examiner that JP 61-89916 discloses that “the score lines are disposed across the longer direction of the sheet material which appears to be the direction of the gas flowing (Fig. 2) depending on the size of the pollution control element.” In any event, the Examiner has concluded that “it would have been obvious to one having ordinary skill in the art to select an appropriate direction for the score lines, e.g. across the width or the length on the basis of its suitability for the intended use as a matter of obvious design choice, absence showing any unexpected results, since JP 61-89916 discloses that any shape, any number or any arrangement can be used for the score lines as long as to achieve the same effect (pages 3-4 of the translation of JP ‘916 – PTO: 99-3188) and since applicants also admit on page 6, lines 28-31 that the score lines can extend in any direction: across the width or length of the sheet material, i.e. parallel or perpendicular to the gas flow.”

Claim 12 defines a pollution control device comprising a housing, a pollution control element having an outer curvature and being disposed within said housing, and a mounting article disposed between said pollution control element and said housing. In accordance with claim 12, the mounting article comprises a sheet material useful for mounting said pollution control element and preventing exhaust gas from bypassing the pollution control element, said sheet material having major top and bottom surfaces, a thickness, a length, and a width corresponding to a direction of exhaust gas through the device, said sheet material having at least one score-line in the major top surface and across the entire width of said sheet material to relieve enough surface tension in said sheet material that, when said sheet material is disposed around the curvature of said pollution control element, cracking or breaking of said sheet material that would otherwise occur is avoided.

Thus, claim 12 requires that the at least one score-line be across the entire width of the sheet material, the width corresponding to a direction of exhaust gas through the device. It is only with such a structure that several of the advantages of the invention are realized. With the score-line(s) across the entire width of the sheet material, surface tension in the sheet material will be relieved when the sheet is wrapped around the outer curvature of the pollution control element. This recited structure thereby provides for the prevention of cracking or breaking of the sheet material. Further, positioning of the score-line(s) across the entire width of the sheet material requires less of the sheet material in order to completely wrap a monolith than a sheet material without one or more score-lines across its width. See, for instance, Examples 1-3 and Comparative Example C1, page 11 line 18 to page 12, line 16.

The grooves or "continuous concaves 1a" of JP 61-89916 extend only in the length direction of the material, rather than across its width. JP 61-89916 unambiguously teaches in the

second full paragraph on page 3 of the PTO translation that the “grooves 1a are continuously provided onto both surfaces of a seal mat 1 in the longer lateral direction.” (emphasis supplied). It is further indicated, in the first full paragraph on page 2 of the PTO translation, that “said mats are wound up to more than the halfway in length direction...” (Fig. 2). Thus, the grooves or continuous concaves 1a run the length of the mat, circumferentially about the honeycomb catalyzer, and perpendicular to the gas flow through the pollution control device.

The Examiner’s reliance on Fig. 2 of JP 61-89916 is misplaced, as that Figure clearly supports, rather than contradicts, applicants’ interpretation of the document. The dimensions of Fig. 2 show that the circumference of the honeycomb catalyzer is greater than its length, so that the longer direction of the mat of JP 61-89916 (the direction in which the concaves 1a extend) extends about the circumference of the honeycomb catalyzer. The examples of JP 61-89916 also support applicants’ interpretation, as the honeycomb catalyzer in the examples is said to have a diameter of 10 cm (thus a circumference greater than 31 cm) and a length of only 20 cm (PTO translation page 5, second full paragraph). JP 61-89916 is devoid of any teaching or suggestion for forming at least one score-line across the entire width of the sheet material and in the direction of exhaust gas through the device.

Moreover, the grooves in the mat of JP 61-89916 are designed solely to reduce the excessive occurrence of compressive pressure on the pollution control element while maintaining an excellent air-tight capability. See PTO translation page 1, paragraph 3 and page 2, first full paragraph. The grooves 1a of JP 61-89916 define gaps in the surface of the sheet material, so that when excessive compressive force is applied, a part of the projections b on the surface of the seal-mat move into the concaves 1a and the compressive force is reduced, preventing breakage of the honeycomb catalyzer. In this regard, according to the translation of JP 61-89919

submitted by applicants, “the shape and number of concaves and method used to produce them, etc. are not limited as long as the above-mentioned effect can be achieved.” Page 5, lines 8-10 (emphasis supplied).

On page 4 of the final Office Action, the Examiner states “JP 61-89916 discloses that any shape, any number or any arrangement can be used for the score lines.” In fact, however, this misstates the PTO translation (pages 3-4) in a very important way. The PTO translation actually states that “[a]s long as said effect is obtained, any shape, any number, and any arrangement means can be used for the grooves.” It is submitted that “arrangement means” is equivalent to “method used to produce them” found on page 5 of the translation of JP 61-89916 provided by the applicants. Thus, the “arrangement means” is the process by which the score lines are arranged on the sheet material, rather than their orientation.

Neither translation of JP 61-89916 contains any suggestion that the direction of the grooves 1a can or should be altered so that they extend across the entire width of the sheet material as defined by the claims. In fact, according to the PTO translation, JP 61-89919 continues by providing that “grooves with a wave surface, grooves with a groove that has an in-line arrangement, or grooves with discontinuous multiple depressions can be given other than grooves as shown in Fig. 1.” Obviously, JP 61-89916 did not contemplate the use of a score-line extending across the entire width of the sheet material, such width corresponding to a direction of exhaust gas through the device.

In addition, the sheet material of JP 61-89916 would be unlikely to maintain its “excellent air-tight capability” if the grooves on both the top and bottom surfaces of the sheet material were positioned in the direction of the gas flow through the device. If the grooves in JP 61-89916 were positioned across the entire width of the sheet material, as applicants’ claim,



exhaust gas may flow through the spacing between the housing and the sheet material or through the spacing between the sheet material and the pollution control element (See Fig. 2). According to JP 61-89916, it is only when and where there is "excessive compressive force" applied that a part of the projections b on the surface of the seal-mat move into the grooves/concaves 1a.

With the grooves extending in the direction of the length of the sheet material (and hence about the circumference of the honeycomb catalyzer and perpendicular to the flow of gas through the device) as shown and described in JP 61-89916, the exhaust gas cannot leak through grooves 1a. There is thus no motivation to modify JP 61-89916 as proposed, since such a modification would render the disclosed device less satisfactory for its intended purpose. See *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1994).

Finally, while applicants' specification may indicate that, in its broadest sense, the invention covered at least one score-line extending across the width or the length of the sheet material, it is unequivocally stated to be preferred to provide the score-line(s) across the width of the sheet material (see, for example, the specification at page 7, lines 2-3). All of the examples include score-lines across the entire width of the sheet material, and all of the drawing figures show the score-lines extending across the entire width of the sheet material. Examples 1-3 and Comparative Example C1 clearly show that, with score-lines across the entire width of the sheet material, less material is required to completely wrap the monolith. Examples 5-7 and Comparative Examples C2 and C3 clearly show that, with score-lines across the entire width of the sheet material, surface cracking is avoided.

With such a clear indication of the preferred embodiment, it is not proper to ignore the differences between the invention defined by applicants' claims and JP 61-89916 on the basis

that the application also discloses a less preferred embodiment, aspects of which may be disclosed in the prior art.

For all of these reasons, claims 12-16, 18-20, 23-25 and 27 are patentable over JP 61-89916.

In addition, claim 18 further defines the invention of claim 12 "wherein said sheet material has at least one score-line in the major bottom surface and across the width of said sheet material, wherein the score-line on the bottom surface have a cross-sectional shape that is V-shaped and the score-lines on the top surface have a cross-sectional shape that is a vertical line." While JP 61-89916 shows grooves in both surfaces of the seal mat 1, it suggests neither at least one score-line in the major bottom surface having a cross-sectional shape that is V-shaped nor score-lines on the top surface having a cross-sectional shape that is a vertical line. Accordingly, claim 18 is patentable over JP 61-89916 for these additional reasons.

Further, claim 47 defines the invention of claim 12 wherein the score-line has a cross-section shape that is a vertical line. JP 61-89916 lacks any suggestion of a score-line having a cross-section shape that is a vertical line. In fact, the grooves in the mat of JP 61-89916 are designed specifically to reduce the excessive occurrence of compressive pressure on the pollution control element by defining gaps in the surface of the sheet material, so that when excessive compressive force is applied, part of the projections b moves into the concaves 1a and the compressive force is reduced, preventing breakage of the honeycomb catalyzer. Grooves having a cross-section shape that is a vertical line would not, of course, be able to function in the manner taught by JP 61-89916. Accordingly, claim 47 is patentable over JP 61-89916 for this additional reason.

Independent claim 28 defines applicants' pollution control device as comprising, *inter alia*, a sheet material useful for mounting a pollution control element and preventing exhaust gas from bypassing the pollution control element, said sheet material having at least one score-line extending across the width of the sheet material in a direction that is parallel to gas flow through said pollution control element, said at least one score-line relieving surface tension in said sheet material that would have been generated by said sheet material being disposed around said pollution control element if not for said at least one score-line.

In contrast, and as discussed in detail above, the grooves or "continuous concaves 1a" of JP 61-89916 extend only in the length direction of the material and in a direction that is perpendicular to gas flow through the catalyzer. Thus, for all of the same reasons discussed above with regard to claim 12, claim 28 and all those claims depending directly or indirectly therefrom are patentable over JP 61-89916.

Further, claim 44 further defines the invention of claim 28 wherein the score-line has a cross-section shape that is a vertical line. JP 61-89916 lacks any suggestion of a score-line having a cross-section shape that is a vertical line and, as discussed above, such a structure would frustrate the intended function of the grooves in the seal-mat of JP 61-89916. Accordingly, claim 44 is patentable over JP 61-89916 for this additional reason.

Independent claim 34 is directed to a mounting article for mounting a pollution control element within a pollution control device, said mounting article comprising a sheet material useful for mounting a pollution control element in a housing, where the pollution control element has an outer curved surface. The sheet material is defined as having a major top surface and a major bottom surface, a thickness, a length dimensioned so as to allow said sheet material to be wrapped lengthwise completely around the outer curved surface of the pollution control element

and form a seal between the pollution control element and the housing to prevent gas from bypassing the pollution control element, a width that is smaller than the length, and at least one score-line formed in at least the major top surface of said sheet material, each score-line being disposed across the entire width of said sheet material.

Again, as discussed in detail above, the grooves or “continuous concaves 1a” of JP 61-89916 extend only in the length direction of the material. For all of the same reasons discussed above with regard to claim 12, claim 34 and all those claims depending directly or indirectly therefrom are patentable over JP 61-89916.

Additionally, claim 45 further defines the invention of claim 34 wherein the score-line has a cross-section shape that is a vertical line. As noted above, JP 61-89916 lacks any suggestion of a score-line having a cross-section shape that is a vertical line and such a structure would frustrate the intended function of its grooves. Accordingly, claim 45 is patentable over JP 61-89916 for this additional reason.

Claim 46 further defines the invention of claim 38, which in turn depends from claim 34, “wherein the score-line on the top surface has a cross-sectional shape that is a vertical line and the score-line on the bottom surface has a cross-sectional shape that is V-shaped.” Again, while JP 61-89916 shows grooves in both surfaces of the seal mat 1, it suggests neither at least one score-line in the major bottom surface having a cross-sectional shape that is V-shaped nor a score-line on the top surface having a cross-sectional shape that is a vertical line. Accordingly, claim 46 is patentable over JP 61-89916 for these additional reasons.

5) Claims 19-20 are Patentable Over JP 61-89916 in View of JP 2-61313

Claims 19-20 all depend, either directly or indirectly, from claim 12. JP 2-61313 supplies none of the deficiencies of JP 61-89916 discussed above with regard to claim 12. Thus, each of these claims is patentable at least on the basis of this dependency from a patentable base claim.

6) Claims 29-31 and 39-41 are Patentable Over JP 61-89916 in view of Corn

Claims 29-31 depend, either directly or indirectly, from claim 28. The Examiner cites Corn as disclosing an oval shape for a pollution control element, concluding that it would have been obvious to select an appropriate shape for the pollution control element. While Corn discloses an oval shaped pollution control element, it supplies none of the deficiencies of JP 86-89916 discussed above with regard to claim 28. Thus, each of the claims 29-31 is patentable at least on the basis of this dependency from a patentable base claim.

In addition, claim 29 further defines the invention of claim 28 wherein said at least one score-line is located proximate to said smaller radius of curvature and no score-line is located proximate to said larger radius of curvature of the oval shaped pollution control element, and claim 30 further defines claim 29 wherein said sheet material has at least one score-line located proximate to each of the two smaller radius of curvatures and no score-line is located proximate to either of said larger radius of curvatures.

As discussed above, JP 61-89916 lacks any suggestion or motivation for providing a groove across the width of the sheet material, and clearly further lacks any suggestion for providing at least one score-line proximate the smaller radius of curvature of an oval pollution control element, with no score-lines proximate the larger radius of curvature of the oval pollution control element. Corn discloses a two-layer mounting mat that is devoid of any score-lines, and

thus fails to supply any of the deficiencies of JP 86-89916 in this regard. Claims 29 and 30 are thus patentable over JP 61-89916 in view of Corn for these additional reasons.

Independent claim 39 defines a pollution control device comprising a pollution control element having an oval shaped cross section and a mounting article disposed between the pollution control element and a housing. The mounting article comprises a sheet material useful for mounting the pollution control element and preventing exhaust gas from bypassing the pollution control element. The sheet material has at least one score-line proximate the smaller radius of curvature of the oval pollution control element and extending across the width of the sheet material in a direction parallel to gas flow through the pollution control element. The sheet material has no score-line located proximate the larger radius of curvature of the oval pollution control element. The at least one score-line located proximate said smaller radius of curvature relieves surface tension in said sheet material that would have been generated by said sheet material being disposed around the radius of curvature of said pollution control element if not for said at least one score-line.

The structure defined by claim 39 thus provides at least one score-line in an area of high surface tension, with no score-lines in the areas of lower surface tension. This structure advantageously relieves surface tension and prevents cracking of the sheet material, while also reducing the amount of sheet material required to wrap a given pollution control element. See specification page 5, second paragraph.

JP 61-89916, on the other hand, discloses a sheet material having grooves 1a extending across the length of the sheet material in a direction perpendicular to gas flow through the pollution control element. As discussed in detail above, JP 61-89916 lacks any suggestion or motivation for providing a groove across the width of the sheet material, and clearly further lacks

any suggestion for providing at least one score-line proximate the smaller radius of curvature of an oval pollution control element, with no score-lines proximate the larger radius of curvature of the oval pollution control element.

Corn discloses a two-layer mounting mat that is devoid of any score-lines, and thus fails to supply any of the deficiencies of JP 86-89916 in this regard. The references, either individually or in combination, fail to teach or suggest the invention as defined in claim 39. Claim 39, as well as claims 40 and 41 which depend from claim 39, are therefore patentable over JP 61-89916 in view of Corn.

7) Claims 12-16, 18-20, 23-25, 27-28, 34, 36-38, 42 and 44-47 are Patentable  
Over JP 2-61313 in View of JP 61-89916

The Examiner has taken the position that JP 2-61313 discloses a pollution control device and method of making a mounting article for a pollution control device comprising a housing containing a pollution control element 1 and said mounting article 5 disposed between the housing and the pollution control element 1, wherein the mounting article 5 comprising a sheet material 5 having major top and bottom surfaces, a thickness, a length, a width and having a plurality of score lines 11 in the top and bottom surfaces of the sheet material 5 and across the width of the sheet material 5.

Independent claims 12, 28 and 34 all require at least one score-line extending across the entire width of the sheet material. It is only with such a structure that several of the advantages of the invention are realized. Thus, with the score-line(s) across the entire width of the sheet material, surface tension in the sheet material will be relieved when the sheet is wrapped around the outer curvature of the pollution control element. This recited structure thus provides for the prevention of cracking or breaking of the sheet material. Further, positioning of the score-line(s)

across the entire width of the sheet material requires less of the sheet material in order to completely wrap a monolith than a sheet material without one or more score-lines across its width.

Neither the recited structure, nor any of the resulting advantages, are taught or suggested by the cited prior art references. JP 2-61313 describes a structure for purifying exhaust gas including a buffer material 5 wrapped around the outer circumference of a ceramic honeycomb 1 and housed in a steel container 6. The buffer material is either provided with holes (translation page 9, lines 1-3) or alternatively, “the same effect can be achieved when the buffer material has a structure where many fine grooves formed diagonally on the surface as in the case of Fig. 2” (translation page 9, lines 13-14). The purpose of these holes or diagonal grooves is to increase the frictional force and to reduce the level of heat conducted by the buffer material.

Hence, JP 2-61313 lacks any teaching or suggestion for positioning a score-line(s) across the entire width of the sheet material. The deficiencies of JP 61-89916 in this regard are discussed at length above. The references, either individually or in combination, fail to teach or suggest the invention as defined in independent claims 12, 28 and 34. These claims, as well as all of the claims depending therefrom, are therefore patentable over JP 2-61313 and JP 61-89916.

Moreover, at least claims 18, 44, 45, 46, 47 are independently patentable over JP 2-61313 and JP 61-89916, as neither suggests forming at least one score-line with a cross-section shape that is a vertical line and/or a score-line on the bottom surface having a cross-sectional shape that is V-shaped, as discussed in more detail above.



8) Claims 29-31 and 39-41 are Patentable Over JP 2-61313, JP 61-89916 and Corn

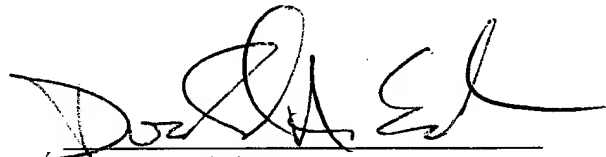
In this rejection, the Examiner applies each of the three references in the same manner noted above with regard to the previous rejections. Accordingly, all of the arguments presented above apply equally to this rejection, and are incorporated herein.

None of the three references suggest sheet material having at least one score-line located proximate said smaller radius of curvature and extending across the width of the sheet material in a direction that is parallel to gas flow through the pollution control element and the sheet material having no score-line located proximate to the larger radius of curvature, as set forth in claim 29, 30 and 39-41. These claims are thus patentable over JP 2-61313, JP 61-89916 and Corn, taken alone or in combination. Further, claims 29-31 depend, either directly or indirectly, from claim 28 and are patentable over the references at least for this reason.

CONCLUSION

For all of the foregoing reasons, it is submitted that all of the claims on appeal are allowable, and a favorable decision to that end is courteously solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Donald A. Schurr', written over a horizontal line.

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## APPENDIX

12. A pollution control device comprising:

a housing;

a pollution control element having an outer curvature and being disposed within said housing; and

a mounting article disposed between said pollution control element and said housing, said mounting article comprising a sheet material useful for mounting said pollution control element and preventing exhaust gas from bypassing the pollution control element, said sheet material having major top and bottom surfaces, a thickness, a length, and a width corresponding to a direction of exhaust gas through the device, said sheet material having at least one score-line in the major top surface and across the entire width of said sheet material to relieve enough surface tension in said sheet material that, when said sheet material is disposed around the curvature of said pollution control element, cracking or breaking of said sheet material that would otherwise occur is avoided.

13. The pollution control device of claim 12 wherein at least two score-lines are formed in the major top surface and across the width of said sheet material.

14. The pollution control device of claim 13 wherein each of said score-lines extend across the entire width of the top surface of said sheet material and the top surface of the sheet material faces the housing.

15. The pollution control device of claim 12 wherein said at least one score-line is perpendicular to the length of said sheet material.

16. The pollution control device of claim 15 wherein the depth of said at least one score-line ranges from about 5 to about 90 percent of the thickness of said sheet material.

18. The pollution control device of claim 12 wherein said sheet material has at least one score-line in the major bottom surface and across the width of said sheet material, wherein the score-line on the bottom surface have a cross-sectional shape that is V-shaped and the score-lines on the top surface have a cross-sectional shape that is a vertical line.

19. The pollution control device of claim 12 wherein said sheet material is intumescent.

20. The pollution control device of claim 13 wherein said sheet material is intumescent, said score-lines extend across the entire width of the top surface of said sheet material and perpendicular to the length of said sheet material and wherein the depth of said score-lines is about 50 percent of the thickness of said sheet material.

23. The pollution control device of claim 12 wherein said pollution control element has a round shaped cross section and said sheet material has a plurality of score-lines in the top surface of said sheet material and the top surface of said sheet material faces said housing.

24. The pollution control device of claim 12 wherein said sheet material has at least one score-line in the bottom surface and across the width of said sheet material and the bottom surface faces said pollution control element.

25. The pollution control device of claim 24 wherein the bottom surface of said sheet material has a plurality of said at least one score-line.

26. A pollution control device comprising:  
a housing;  
a pollution control element disposed within said housing; and  
a mounting article disposed between said pollution control element and said housing, said mounting article comprising a sheet material useful for mounting said pollution control element, said sheet material having major top and bottom surfaces, a thickness, a length and a width, said sheet material having at least one score-line in at least one of the major top and bottom surfaces of said sheet material to relieve surface tension in said sheet material, said at least one score-line extending in a direction parallel to gas flow through said pollution control element, wherein said sheet material includes a first layer suitable for receiving strips of a second layer of sheet material, said strips of a second layer of sheet material attached to said first layer in an adjacent manner to provide said at least one score-line.

27. The pollution control device of claim 12 wherein said score-lines have a cross-sectional shape selected from a vertical line shape, a V-shape, a U-shape, a triangular shape, and a square shape.

28. A pollution control device comprising:  
a housing;  
a pollution control element disposed within said housing; and  
a mounting article disposed between said the pollution control element and said housing, said mounting article comprising a sheet material useful for mounting said pollution control element and preventing exhaust gas from bypassing the pollution control element, said sheet material having a major top surface facing said housing and a major bottom surface facing said pollution control element, a thickness, a length and a width, said sheet material having at least one score-line extending across the width of the sheet material in a direction that is parallel to gas flow through said pollution control element, said at least one score-line relieving surface tension in said sheet material that would have been generated by said sheet material being disposed around said pollution control element if not for said at least one score-line.

29. The pollution control device of claim 28 wherein said pollution control element has an oval shaped cross section defined by a larger radius of curvature and a smaller radius of curvature, said smaller radius of curvature is smaller than said larger radius of curvature, said at least one score-line is located proximate to said smaller radius of curvature and no score-line is located proximate to said larger radius of curvature.

30. The pollution control device of claim 29 wherein the oval shaped cross section of said pollution control device is defined by two larger radius of curvatures that are separated from each other by two smaller radius of curvatures and said sheet material has at least one score-line

located proximate to each of said smaller radius of curvature and no score-line is located proximate to either of said larger radius of curvatures.

31. The pollution control device of claim 28 wherein said at least one score-line has a cross-sectional shape selected from a vertical line shape, a V-shape, a U-shape, a triangular shape, and a square shape.

34. A mounting article for mounting a pollution control element within a pollution control device, said mounting article comprising a sheet material useful for mounting a pollution control element in a housing, where the pollution control element has an outer curved surface, said sheet material having a major top surface facing the housing and a major bottom surface facing the pollution control device, a thickness, a length dimensioned so as to allow said sheet material to be wrapped lengthwise completely around the outer curved surface of the pollution control element and form a seal between the pollution control element and the housing, wherein the seal prevent gas from bypassing the pollution control element, a width that is smaller than the length, and at least one score-line formed in at least the major top surface of said sheet material, each score-line being disposed across the entire width of said sheet material.

36. The mounting article of claim 34 wherein said score-line is perpendicular to the length of said sheet material.

37. The pollution control device of claim 34 wherein said at least one score-line has a cross-sectional shape selected from a vertical line shape, a V-shape, a U-shape, a triangular shape, and a square shape.

38. The pollution control device of claim 34, wherein the sheet material has at least one score-line formed in the major top surface and at least one score-line formed in the major bottom surface and the major top surface is positioned adjacent to the housing.

39. A pollution control device comprising:

a housing;

a pollution control element disposed within said housing, said pollution control element having an oval shaped cross section defined by a larger radius of curvature and a smaller radius of curvature; and

a mounting article disposed between said the pollution control element and said housing, said mounting article comprising a sheet material useful for mounting said pollution control element and preventing exhaust gas from bypassing the pollution control element, said sheet material having a major top surface facing said housing and a major bottom surface facing said pollution control element, a thickness, a length and a width, said sheet material having at least one score-line located proximate said smaller radius of curvature and extending across the width of said sheet material in a direction that is parallel to gas flow through said pollution control element and said sheet material having no score-line located proximate to said larger radius of curvature, said at least one score-line located proximate said smaller radius of curvature relieving surface tension in said sheet material that would have been generated by said sheet

material being disposed around the radius of curvature of said pollution control element if not for said at least one score-line.

40. The pollution control device of claim 39, wherein the score-line has a cross-sectional shape selected from a vertical line shape, a V-shape, a U-shape, a triangular shape, and a square shape.

41. The pollution control device of claim 39, wherein the score-line has a cross-sectional shape that is a vertical line shape.

42. The pollution control device of claim 34, wherein the score-line is in the form of a repeating pattern across the entire width of the sheet material.

43. The pollution control device of claim 42, wherein the repeating pattern is in the form of a saw tooth wave or a sine wave.

44. The pollution control device of claim 28, wherein the score-line has a cross-section shape that is a vertical line.

45. The pollution control device of claim 34, wherein the score-line has a cross-sectional shape that is a vertical line.



46. The pollution control device of claim 38, wherein the score-line on the top surface has a cross-sectional shape that is a vertical line and the score-line on the bottom surface has a cross-sectional shape that is V-shaped.

47. The pollution control device of claim 12, wherein the score-line has a cross-sectional shape that is a vertical line.